



Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Creve Coeur Creek

Water Body Segment at a Glance:

County: St. Louis
Nearby Cities: Maryland Heights and Creve Coeur
Length of impaired segment: 2 miles
Pollutant 1: Low Dissolved Oxygen
Source 1: No Source Identified
Pollutants 2,3: Bacteria, Chloride
Source 2,3: Urban Nonpoint Sources
Water Body ID: 1703



Scheduled for TMDL development: 2011 for bacteria and chloride; 2014 for low D.O.

Description of the Problem

Beneficial uses of Creve Coeur Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category B

Uses that are impaired

- Protection of Warm Water Aquatic Life
- Whole Body Contact Recreation – Category B

Standards that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E.coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.
- The criteria for chloride are found in 10 CSR 20-7.031 Table A. The chronic criterion is 230 milligrams per liter (mg/L or parts per million) and the acute criterion is 860 mg/L.
- Also in Table A, the criterion for dissolved oxygen in streams is a minimum of 5 mg/L.

Background information and water quality data

Creve Coeur Creek is an urban stream that starts in St. Louis and flows north to the Missouri River. The evidence for impairment is based on data collected by the U.S. Geological Survey, or USGS, and the Metropolitan Sewer District, or MSD, from 2001-07. Creve Coeur Creek is designated as Category B for the whole body contact recreation use, which means it has places deep enough for total immersion (i.e., swimming), but they may be on private lands or inaccessible to the public.

Water quality conditions in Creve Coeur Creek are not protective of aquatic life. Dissolved oxygen is important as many aquatic organisms require high levels of oxygen to survive. For dissolved oxygen, if more than 10 percent of measurements in a water body fail to meet the water quality criterion that water body is judged to be impaired. In the case of Creve Coeur Creek, 12 of 80 samples (15 percent) did not meet the water quality criterion (Figure 1). While no source has been identified for the low dissolved oxygen, it is likely caused by urban nonpoint source, like the chloride and bacteria. Storm water (urban nonpoint source runoff) is known to wash all sorts of pollutants from the watershed into its receiving water body.

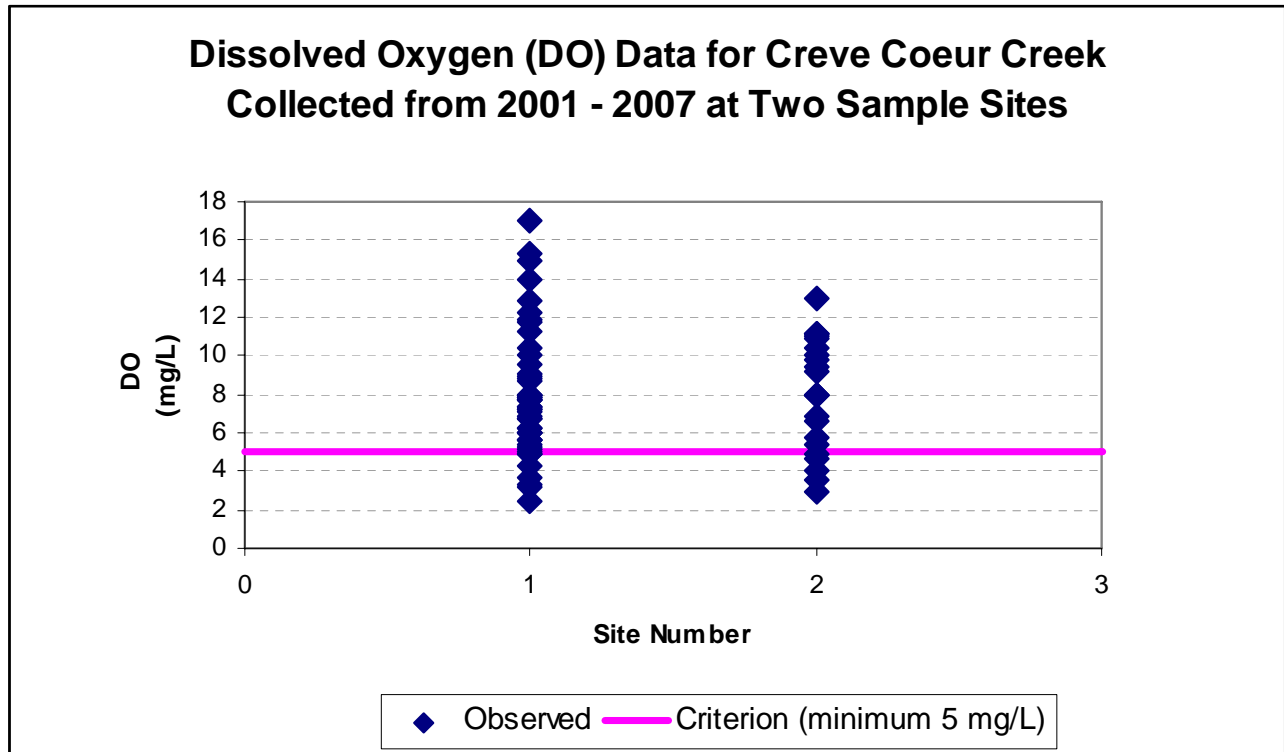


Figure 1

The Listing Methodology stipulates that only one exceedance of the chloride criteria in the last three years of available data is necessary to constitute an impairment. The USGS data contain several samples where the chronic standard of 230 mg/L is exceeded in Creve Coeur Creek in that timeframe (Figure 2).

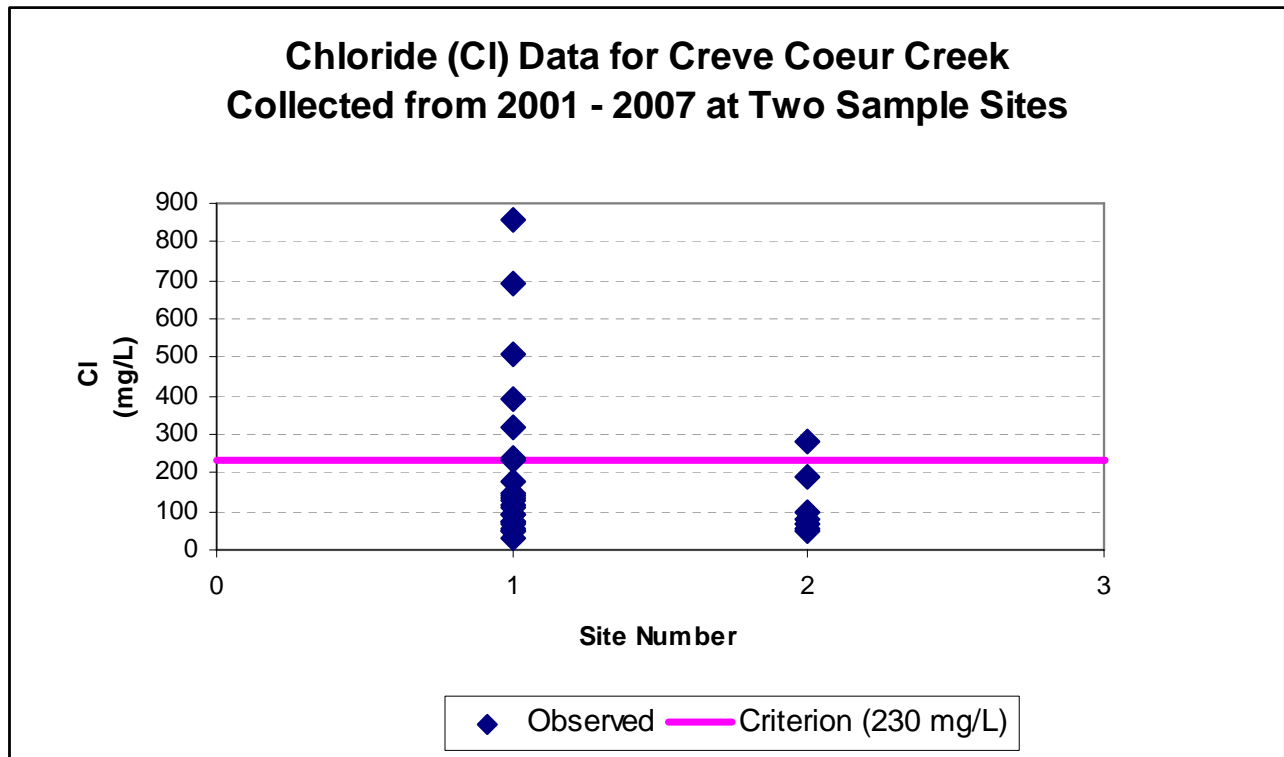


Figure 2

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. *Escherichia coli*, or *E. coli*, are bacteria found in the intestines of warm blooded animals and used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine^{1,2}. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

Bacteria data gathered by the USGS and MSD show high levels of bacteria in Creve Coeur Creek every year from 2001-2007. The listing methodology states that, to be considered not impaired, a water body must meet the water quality criterion in each of the last three years of available data and that the geometric mean must consist of at least five data points within the recreational season. In Creve Coeur Creek, the geometric means have been calculated as 449 col/100 mL for 2005, 975 col/100 mL for 2006, and 242 col/100 mL for 2007 (Figure 3). These exceed the criterion of 206 col/100 mL for Category B. Please note that in the years 2001-2004, even though the geomean

¹ Hudault S, Guignot J, Servin AL (July 2001). "[Escherichia coli strains colonising the gastrointestinal tract protect germfree mice against Salmonella typhimurium infection](#)". *Gut* **49** (1): 47–55

² Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424–8.

exceeded the criterion, they were based on fewer than five data points and so cannot be used to assess impairment. In addition, those years are outside the allotted time frame of the most recent three years of available data.

People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take commonsense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.

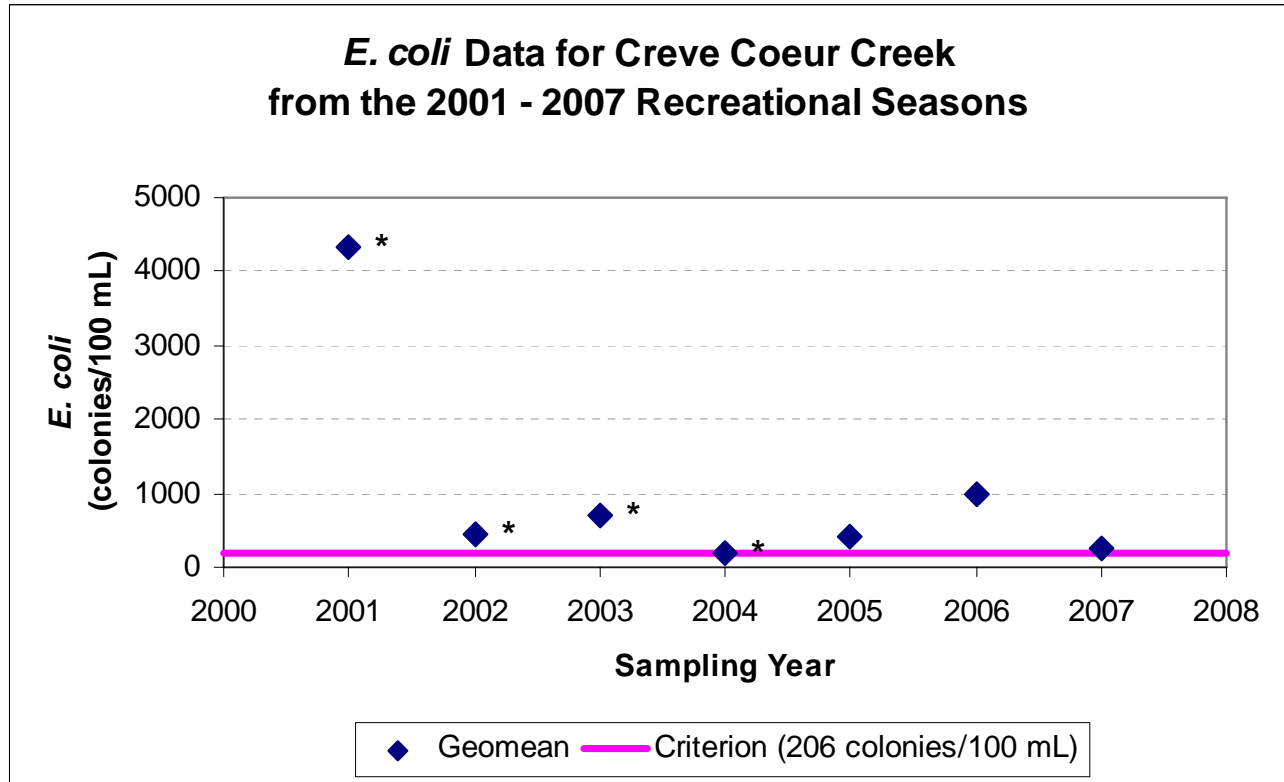
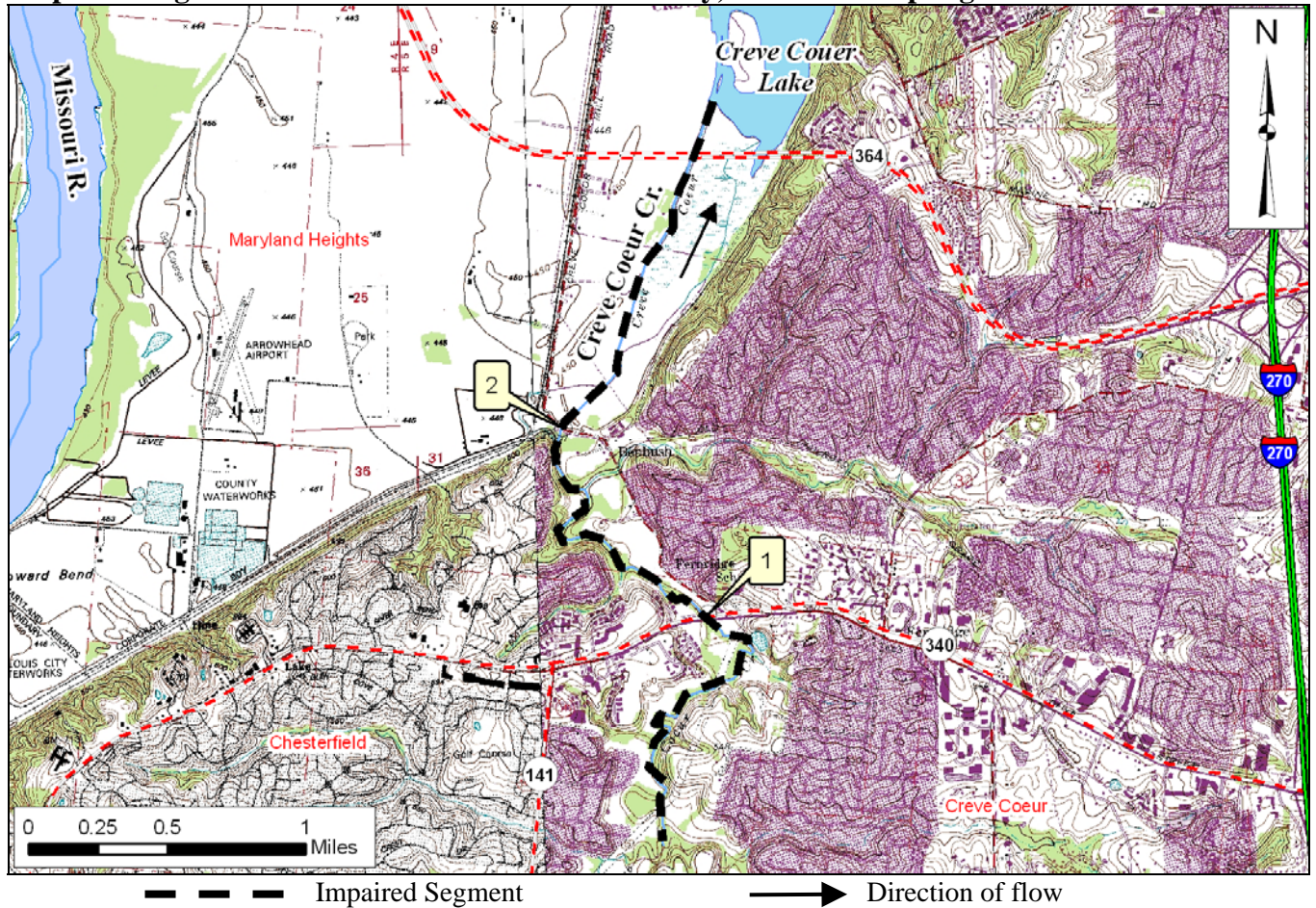


Figure 3

Sample sites where data from the above figures were collected are below. These sites are also depicted on the map on the next page.

Sample Sites	
1	Creve Coeur Creek at State Highway 340
2	Creve Coeur Creek at Mill Bridge Road

Map Showing Creve Coeur Creek in St. Louis County, Mo. and Sampling Sites



For more information call or write:

Missouri Department of Natural Resources
Water Protection Program

P.O. Box 176, Jefferson City, MO 65102-0176

1-800-361-4827 or 573-751-1300 office

573-522-9920 fax

Program Home Page: www.dnr.mo.gov/env/wpp/index.html